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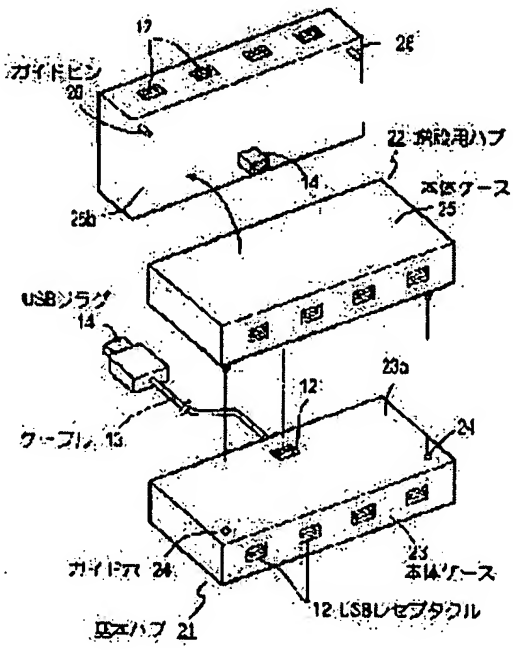
(54) EXTENSION STRUCTURE OF USB HUB AND USB HUB

(57)Abstract:

PROBLEM TO BE SOLVED: To provide the extension structure of a USB hub existing no obstructive cable.

SOLUTION: The extension structure comprises a cable 13 equipped with a USB plug 14 at the top end thereof, a guide hole 24 and USB receptacle 12 on the surface 23a of a basic hub 71 having a plurality of USB receptacles 12 on the surface along the vertical direction thereof and a guide pin 26 which is engagedly joined with the lower surface 25b of an extension hub 22 provided with a plurality of the USB receptacles 12 on the surface along the vertical direction and the USB plug 14 which is coupled with the USB receptacle 12 on the upper surface of the basic hub 23a. By mounting the extension hub 22 on the basic hub 21, the devices and parts installed as mentioned above are properly positioned with each other and electrically connected.



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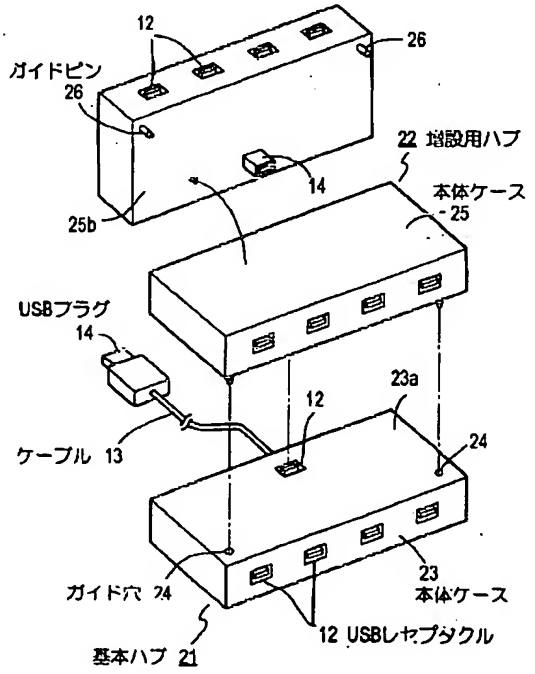
(54)【発明の名称】　ＵＳＢハブの増設構造及びＵＳＢハブ

(57)【要約】
【課題】　じゃまなケーブルが存在しないＵＳＢハブの増設構造を提供する。
【解決手段】　先端にＵＳＢプラグ１４が取り付けられたケーブル１３を具備し、上下方向に沿う面に複数のＵＳＢレセプタクル１２を有する基本ハブ２１の上面２３ａにガイド穴２４とＵＳＢレセプタクル１２とを設け、上下方向に沿う面に複数のＵＳＢレセプタクル１２を有する増設用ハブ２２の下面２５ｂにガイド穴２４と係合するガイドピン２６と、基本ハブ上面２３ａのＵＳＢレセプタクル１２と結合されるＵＳＢプラグ１４とを設ける。基本ハブ２１上に増設用ハブ２２を積載することにより、それらが互いに位置決めされて電気的に接続される。



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【特許請求の範囲】

【請求項１】 先端にＵＳＢプラグが取り付けられたケーブルを具備し、上下方向に沿う面に複数のＵＳＢレセプタクルを有する基本ハブと、上下方向に沿う面に複数のＵＳＢレセプタクルを有する増設用ハブとよりなるＵＳＢハブの増設構造であって、

上記基本ハブの上面にガイド穴とＵＳＢレセプタクルとが設けられ、

上記ガイド穴と係合するガイドピンと上記上面に設けられたＵＳＢレセプタクルと結合されるＵＳＢプラグとが上記増設用ハブの下面に設けられ、

上記基本ハブ上に上記増設用ハブを積載することにより、それら基本ハブと増設用ハブとが互いに位置決めされて電気的に接続されることを特徴とするＵＳＢハブの増設構造。

【請求項２】 請求項１記載のＵＳＢハブの増設構造において、

上記増設用ハブの上面に、上記基本ハブの上面と同様に、ガイド穴とＵＳＢレセプタクルとが設けられ、複数の増設用ハブが互いに積載されて電気的に接続される構造とされていることを特徴とするＵＳＢハブの増設構造。

【請求項３】 本体ケースの上下方向に沿う面に複数のＵＳＢレセプタクルが配置され、

上記本体ケースの上面に、相手方増設用ハブのガイドピンと係合するガイド穴と、その増設用ハブの下面に設けられているＵＳＢプラグと結合されるＵＳＢレセプタクルとが設けられ、

先端にＵＳＢプラグが取り付けられたケーブルが上記本体ケースから導出されていることを特徴とするＵＳＢハブ。

【請求項４】 本体ケースの上下方向に沿う面に複数のＵＳＢレセプタクルが配置され、

上記本体ケースの下面に、相手方基本ハブのガイド穴と係合するガイドピンと、その基本ハブの上面に設けられているＵＳＢレセプタクルと結合されるＵＳＢプラグとが設けられていることを特徴とするＵＳＢハブ。

【請求項５】 請求項４記載のＵＳＢハブにおいて、

上記本体ケースの上面にガイド穴とＵＳＢレセプタクルとが設けられ、

上記ガイド穴は上記ガイドピンの直上に位置されて互いに係合可能な形状とされ、

上記上面に設けられたＵＳＢレセプタクルは上記ＵＳＢプラグの直上に位置されて互いに結合可能な構造とされていることを特徴とするＵＳＢハブ。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】この発明はＵＳＢ（ユニバーサル・シリアル・バス）接続方式に用いられるＵＳＢハブに関し、特にその増設構造に関する。

【０００２】

【従来の技術】ＵＳＢハブの従来構成の一例を図３に示す。本体ケース１１はこの例では直方体状とされ、この本体ケース１１の前面にＵＳＢコネクタのレセプタクル（ＵＳＢレセプタクル）１２が配列されて設けられている。ＵＳＢレセプタクル１２はこの例では４つ配置されている。本体ケース１１の背面側からはケーブル１３が導出されており、このケーブル１３の先端にはＵＳＢコネクタのプラグ（ＵＳＢプラグ）１４が取り付けられている。

【０００３】ＵＳＢプラグ１４は例えばコンピュータ本体（図示せず）に接続され、このようにコンピュータ本体に接続されたケーブル付きＵＳＢハブ１５を介して、マウスやキーボードあるいはプリンタといった各種周辺機器を簡易に接続することができるものとなっている。

【０００４】

【発明が解決しようとする課題】ＵＳＢ接続方式は複雑なインタフェースを統一化し、接続を容易にするものとして、近年注目されており、各種周辺機器への適用が進展している。しかるに、一台のコンピュータ本体に対し、接続したい周辺機器の数が増えると、図３に示したようなＵＳＢハブ１５ではコネクタ数、つまりＵＳＢレセプタクル１２の数が足りなくなるといった状況が発生し、このような場合、従来においては例えばＵＳＢハブ１５どうしを連結してＵＳＢレセプタクル１２の数を増やすといったことが行われていた。

【０００５】ＵＳＢハブ１５どうしの連結は一方のＵＳＢハブ１５のＵＳＢレセプタクル１２に、他方のＵＳＢハブ１５のＵＳＢプラグ１４を接続することによって行われるものの、このような接続によってＵＳＢハブ１５を増設すると、ケーブル１３の数が増え、その分ＵＳＢハブ１５の周囲がケーブル１３によって占有され、煩雑でじゃまなものとなっていた。この発明の目的は上述した問題に鑑み、ケーブル数が増加せず、つまりケーブルがじゃまになることのないＵＳＢハブの増設構造を提供することにあり、さらにそれに用いるＵＳＢハブを提供することにある。

【０００６】

【課題を解決するための手段】請求項１の発明によれば、先端にＵＳＢプラグが取り付けられたケーブルを具備し、上下方向に沿う面に複数のＵＳＢレセプタクルを有する基本ハブと、上下方向に沿う面に複数のＵＳＢレセプタクルを有する増設用ハブとを用いるものとされ、基本ハブの上面にガイド穴とＵＳＢレセプタクルとが設けられ、上記ガイド穴と係合するガイドピンと上記上面に設けられたＵＳＢレセプタクルと結合されるＵＳＢプラグとが増設用ハブの下面に設けられ、基本ハブ上に増設用ハブを積載することにより、それら基本ハブと増設用ハブとが互いに位置決めされて電気的に接続される構造とされる。

【０００７】請求項２の発明では請求項１の発明において、増設用ハブの上面に、基本ハブの上面と同様に、ガイド穴とＵＳＢレセプタクルとが設けられ、複数の増設用ハブが互いに積載されて電気的に接続される構造とされる。請求項３の発明によれば、ＵＳＢハブは本体ケースの上下方向に沿う面に複数のＵＳＢレセプタクルが配置され、本体ケースの上面に相手方増設用ハブのガイドピンと係合するガイド穴と、その増設用ハブの下面に設けられているＵＳＢプラグと結合されるＵＳＢレセプタクルとが設けられ、先端にＵＳＢプラグが取り付けられたケーブルが本体ケースから導出されたものとされる。

【０００８】請求項４の発明によれば、ＵＳＢハブは本体ケースの上下方向に沿う面に複数のＵＳＢレセプタクルが配置され、本体ケースの下面に相手方基本ハブのガイド穴と係合するガイドピンと、その基本ハブの上面に設けられているＵＳＢレセプタクルと結合されるＵＳＢプラグとが設けられたものとされる。請求項５の発明では請求項４の発明において、本体ケースの上面にガイド穴とＵＳＢレセプタクルとが設けられ、上記ガイド穴は上記ガイドピンの直上に位置されて互いに係合可能な形状とされ、上記上面に設けられたＵＳＢレセプタクルは上記ＵＳＢプラグの直上に位置されて互いに結合可能な構造とされる。

【０００９】

【発明の実施の形態】この発明の実施の形態を図面を参照して実施例により説明する。なお、図３と対応する部分には同一符号を付してある。図１はこの発明によるＵＳＢハブの増設構造の一実施例を示したものであり、この例ではＵＳＢハブとして基本ハブ２１と増設用ハブ２２とが用いられる。基本ハブ２１はこの例では直方体状をなす本体ケース２３を有し、その上下方向に沿う前面にＵＳＢレセプタクル１２が４つ配置されたものとなっており、本体ケース２３の背面側からはＵＳＢプラグ１４が取り付けられたケーブル１３が導出されている。

【００１０】本体ケース２３の上面２３ａには一対のガイド穴２４が設けられ、さらにＵＳＢレセプタクル１２が１つ設けられている。ガイド穴２４はこの例では図に示したように前面側の両隅部に形成され、ＵＳＢレセプタクル１２は背面側の中央部に設けられている。一方、増設用ハブ２２は基本ハブ２１の本体ケース２３と同様の外形形状を有する本体ケース２５を具備し、その上下方向に沿う前面にはＵＳＢレセプタクル１２が４つ配置されたものとなっている。

【００１１】この本体ケース２５の下面２５ｂには一対のガイドピン２６とＵＳＢプラグ１４とが設けられており、これらガイドピン２６及びＵＳＢプラグ１４はそれぞれ基本ハブ２１の本体ケース２３の上面２３ａに設けられているガイド穴２４及びＵＳＢレセプタクル１２と対応する位置に配置され、ガイドピン２６はガイド穴２４と係合可能とされ、またＵＳＢプラグ１４はＵＳＢレセプタクル１２と結合可能とされている。

【００１２】本体ケース２３及び２５は例えば樹脂製とされる。この場合、ガイド穴２４は成形によって形成され、またガイドピン２６は本体ケース２５と一体成形によって形成することができる。上記のような構成とされた基本ハブ２１と増設用ハブ２２との連結は、基本ハブ２１上に増設用ハブ２２を積載することによって行われ、一対のガイド穴２４にガイドピン２６がそれぞれ係合されて基本ハブ２１と増設用ハブ２２とは互いに位置決めされ、また対向するＵＳＢレセプタクル１２とＵＳＢプラグ１４とが結合されて基本ハブ２１と増設用ハブ２２とが電気的に接続される。

【００１３】従って、この例によればケーブル１３は１本であって、ケーブル数を増加させることなく、ＵＳＢハブを増設することができ、つまりＵＳＢレセプタクル１２の数を増やすことができる。なお、基本ハブ２１及び増設用ハブ２２はこの例では共にその前面に４つのＵＳＢレセプタクル１２を有するものとなっているが、ＵＳＢレセプタクル１２の数はこれに限るものではなく、また例えば本体ケース２３，２５のそれぞれ側面にもＵＳＢレセプタクル１２を有するものとしてもよい。

【００１４】さらに、ガイド穴２４及びガイドピン２６も例えば基本ハブ２１及び増設用ハブ２２の互いに対向する上面２３ａ及び下面２５ｂのそれぞれ４隅に設けるようにしてもよい。図２はＵＳＢハブをさらに増設できるようにした例を示したものであり、この例では増設用ハブ２７は図１に示した増設用ハブ２２に対して、その本体ケース２５の上面２５ａにガイド穴２４とＵＳＢレセプタクル１２とが設けられたものとされる。

【００１５】一対のガイド穴２４は下面２５ｂのガイドピン２６の直上にそれぞれ位置され、またＵＳＢレセプタクル１２は下面２５ｂのＵＳＢプラグ１４の直上に位置されており、即ちこれらガイド穴２４とＵＳＢレセプタクル１２とは基本ハブ２１の上面２３ａに設けられているガイド穴２４及びＵＳＢレセプタクル１２と同様に設けられている。この増設用ハブ２７を用いれば、増設用ハブ２７どうしを互いに積載することができ、基本ハブ２１上に積載した増設用ハブ２７上に、さらに必要に応じて増設用ハブ２７を増設していくことができる。

【００１６】なお、上述した基本ハブ２１、増設用ハブ２２，２７には適宜外部電源から電力を供給するための電源用コネクタが設けられる。

【００１７】

【発明の効果】以上説明したように、この発明によるＵＳＢハブの増設構造によれば、基本ハブ上に増設用ハブを積載することにより、互いの対向面に設けられたＵＳＢプラグとレセプタクルとが結合されて、それらが電気的に接続されるため、従来ＵＳＢハブどうしの連結において存在していた連結用のケーブルは不要であり、よって煩雑でじゃまなものとなっていたケーブルの存在を解

消することができる。

【００１８】さらに、請求項２の発明によれば、増設用ハブどうしを積載して接続することができるため、必要に応じてケーブル数を増加させることなく、増設用ハブ上にさらに増設用ハブを増設していくことができる。

【図面の簡単な説明】

【図１】請求項１の発明の一実施例を示す斜視図。

【図２】請求項２の発明の一実施例を示す斜視図。

【図３】ＵＳＢハブの従来構成を示す斜視図。

【図１】

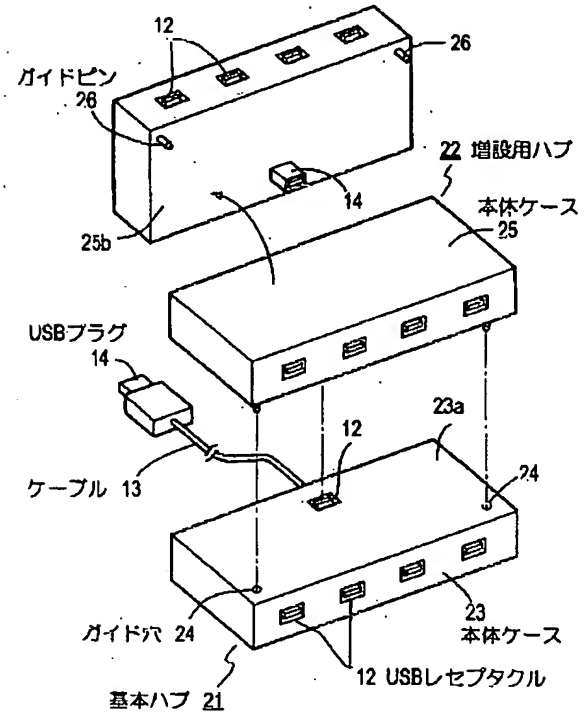

図1

【図２】

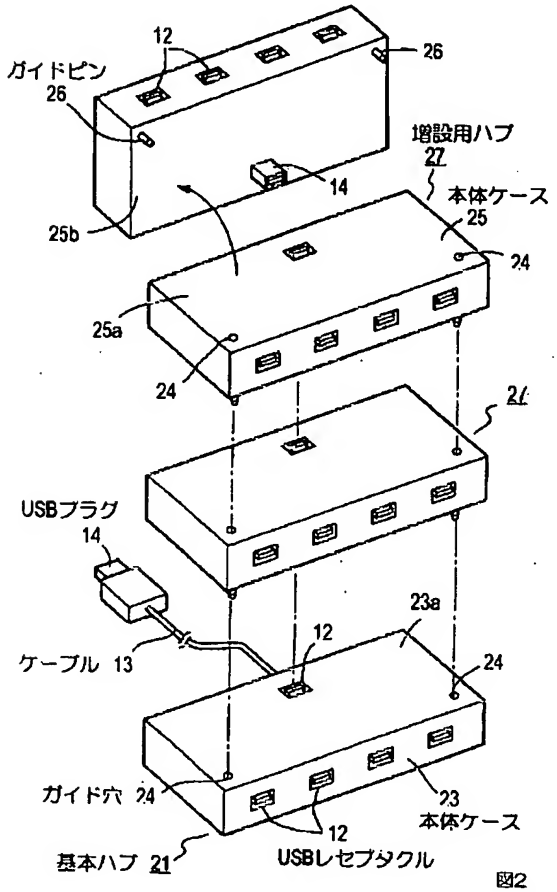

図2

【図３】

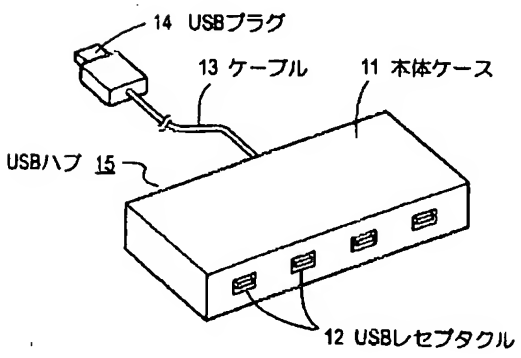

図3

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TECHNICAL FIELD

[Field of the Invention] This invention relates especially to that extension structure about the USB hub used for a USB (Universal Serial Bus) connection type.

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PRIOR ART

[Description of the Prior Art] An example of the conventional configuration of a USB hub is shown in drawing 3 : In this example, the body case 11 is made into the shape of a rectangular parallelepiped, and the receptacle (USB receptacle) 12 of a USB connector is arranged, and it is prepared in the front face of this body case 11. Four USB receptacles 12 are arranged in this example. From the tooth-back side of the body case 11, the cable 13 is drawn and the plug (USB plug) 14 of a USB connector is attached at the tip of this cable 13.
[0003] The USB plug 14 has connected simply a mouse and various peripheral devices, such as a keyboard or a printer, through USB hub 15 with a cable which was connected to the body of a computer (not shown) and was connected to the body of a computer in this way.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] A USB connection type unification-izes a complicated interface, it is observed in recent years as what makes connection easy, and application to various peripheral devices is progressing. However, when the number of peripheral devices to connect increased to the body of one computer, in USB hub 15 as shown in drawing 3 , the situation of the number of connectors, i.e., the number of the USB receptacles 12, becoming less insufficient occurring, connecting USB hub 15 in the former in such a case, and increasing the number of the USB receptacles 12 was performed.
[0005] Although it was performed by connecting the USB plug 14 of USB hub 15 of another side to the USB receptacle 12 of one USB hub 15, when USB hub 15 was extended by such connection, the number of connection of USB hub 15 of cables 13 increased, the perimeter of the part USB hub 15 was occupied by the cable 13, and it became complicated and obstructive. It is in the purpose of this invention offering the extension structure of a USB hub where the number of cables does not increase, that is, a cable does not become obstructive, in view of the problem mentioned above, and is in offering the USB hub further used for it.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to the extension structure of the USB hub by this invention Since the USB plug and receptacle which were prepared in the mutual opposed face by loading the hub for extension on a basic hub are combined and they are connected electrically, The cable for connection which existed in connection of USB hubs conventionally is unnecessary, and existence of the cable which therefore became complicated and obstructive can be canceled.
[0018] Furthermore, the hub for extension can be further extended on the hub for extension, without making the number of cables increase if needed according to invention of claim 2, since the hubs for extension can be loaded and it can connect.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The perspective view showing one example of invention of claim 1.
[Drawing 2] The perspective view showing one example of invention of claim 2.
[Drawing 3] The perspective view showing the conventional configuration of a USB hub.

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MEANS

[Means for Solving the Problem] The basic hub which has two or more USB receptacles in the field which according to invention of claim 1 possesses the cable with which the USB plug was attached at the tip, and meets in the vertical direction, The hub for extension which has two or more USB receptacles shall be used for the field which meets in the vertical direction. A guide hole and a USB receptacle are prepared in the top face of a basic hub, and the USB plug combined with the guide pin which engages with the above-mentioned guide hole, and the USB receptacle prepared in the above-mentioned top face is prepared in the inferior surface of tongue of the hub for extension. By loading the hub for extension on a basic hub, it considers as the structure where these basic hub and the hub for extension are positioned mutually, and are connected electrically.
[0007] In invention of claim 2, it considers as the structure which a guide hole and a USB receptacle are prepared in the top face of the hub for extension, and two or more hubs for extension are mutually loaded into it, and is electrically connected to it like the top face of a basic hub in invention of claim 1. According to invention of claim 3, two or more USB receptacles shall have been arranged in the field where a USB hub meets in the vertical direction of a body case, the USB receptacle combined with the guide hole which engages with the guide pin of the hub for other party extension on the top face of a body case, and the USB plug prepared in the inferior surface of tongue of the hub for extension should be prepared, and it should be drawn from the body case in the cable with which the USB plug was attached at the tip.
[0008] According to invention of claim 4, it should be prepared in the guide pin with which two or more USB receptacles are arranged in the field which meets in the vertical direction of a body case, and a USB hub engages with the guide hole of an other party basic hub on the inferior surface of tongue of a body case, and the USB plug combined with the USB receptacle prepared in the top face of the basic hub. In invention of claim 5, in invention of claim 4, a guide hole and a USB receptacle are prepared in the top face of a body case, the above-mentioned guide hole is located in right above [of the above-mentioned guide pin], and each other is made into the configuration which can be engaged, and the USB receptacle prepared in the above-mentioned top face is located in right above [of the above-mentioned USB plug], and is mutually made into combinable structure.
[0009]
[Embodiment of the Invention] With reference to a drawing, an example explains the gestalt of implementation of this invention. In addition, the same sign is given to drawing 3 and a corresponding part. Drawing 1 shows one example of the extension structure of the USB hub by this invention, and the basic hub 21 and the hub 22 for extension are used as a USB hub in this example. The basic hub 21 has the body case 23 where the shape of a rectangular parallelepiped is made in this example, it is that by which four USB receptacles 12 have been arranged in the front face which meets in that vertical direction, and the cable 13 with which the USB plug 14 was attached is drawn from the tooth-back side of the body case 23.
[0010] The guide hole 24 of a pair is established in top-face 23a of the body case 23, and one USB receptacle 12 is formed further. As the guide hole 24 was shown in drawing in this example, it is formed in both the corners by the side of a front face, and the USB receptacle 12 is formed in the center section by the side of a tooth back. On the other hand, the hub 22 for extension possessed the body case 23 of the basic hub 21, and the body case 25 where it had the same appearance configuration, and four USB receptacles 12 were arranged in the front face which meets in the vertical direction.

[0011] By preparing the guide pin 26 and the USB plug 14 of a pair in inferior-surface-of-tongue 25b of this body case 25, these guide pins 26 and the USB plug 14 are arranged in the guide hole 24 established in top-face 23a of the body case 23 of the basic hub 21, respectively and the USB receptacle 12, and a corresponding location, and it is supposed that the guide hole 24 and engagement are possible for a guide pin 26, and the USB receptacle 12 and association of the USB plug 14 are enabled.
[0012] Let the body cases 23 and 25 be for example, the products made of resin. In this case, the guide hole 24 is formed by shaping, and can the body case 25 and really form a guide pin 26 with shaping. The connection to the basic hub 21 and the hub 22 for extension which were considered as the above configurations It is carried out by loading the hub 22 for extension on the basic hub 21, a guide pin 26 engages with the guide hole 24 of a pair, respectively, and the basic hub 21 and the hub 22 for extension are positioned mutually. Moreover, the USB receptacle 12 and the USB plug 14 which counter are combined, and the basic hub 21 and the hub 22 for extension are connected electrically.
[0013] Therefore, according to this example, there is one cable 13, without making the number of cables increase, can extend a USB hub, that is, can increase the number of the USB receptacles 12. In addition, although the basic hub 21 and the hub 22 for extension are what has four USB receptacles 12 in that front face in this example both, the number of the USB receptacles 12 is not restricted to this, and is good also for a side face respectively also as a thing of the body cases 23 and 25 which has the USB receptacle 12.
[0014] furthermore, top-face 23a countered mutually and inferior-surface-of-tongue 25b of the guide hole 24, a guide pin 26 21, for example, a basic hub, and the hub 22 for extension -- you may make it prepare in four corners, respectively Drawing 2 should show the example which enabled it to extend a USB hub further, and it should be prepared in this example in the guide hole 24 and the USB receptacle 12 at top-face 25a of that body case 25 to the hub 22 for extension which showed the hub 27 for extension to drawing 1 .
[0015] It is located in right above [of the guide pin 26 of inferior-surface-of-tongue 25b], respectively, the USB receptacle 12 is located in right above [of the USB plug 14 of inferior-surface-of-tongue 25b], namely, the guide hole 24 of a pair is formed by these guides hole 24 and the USB receptacle 12 like the guide hole 24 established in top-face 23a of the basic hub 21, and the USB receptacle 12. If this hub 27 for extension is used, hub 27 for extension can be loaded mutually and the hub 27 for extension can be further extended on the hub 27 for extension loaded on the basic hub 21 if needed.
[0016] In addition, the connector for power sources for supplying power from an external power suitably is prepared in the basic hub 21 and the hubs 22 and 27 for extension which were mentioned above.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates especially to that extension structure about the USB hub used for a USB (Universal Serial Bus) connection type.
[0002]
[Description of the Prior Art] An example of the conventional configuration of a USB hub is shown in drawing 3 . In this example, the body case 11 is made into the shape of a rectangular parallelepiped, and the receptacle (USB receptacle) 12 of a USB connector is arranged, and it is prepared in the front face of this body case 11. Four USB receptacles 12 are arranged in this example. From the tooth-back side of the body case 11, the cable 13 is drawn and the plug (USB plug) 14 of a USB connector is attached at the tip of this cable 13.
[0003] The USB plug 14 has connected simply a mouse and various peripheral devices, such as a keyboard or a printer, through USB hub 15 with a cable which was connected to the body of a computer (not shown) and was connected to the body of a computer in this way.
[0004]
[Problem(s) to be Solved by the Invention] A USB connection type unification-izes a complicated interface, it is observed in recent years as what makes connection easy, and application to various peripheral devices is progressing. However, when the number of peripheral devices to connect increased to the body of one computer, in USB hub 15 as shown in drawing 3 , the situation of the number of connectors, i.e., the number of the USB receptacles 12, becoming less insufficient occurring, connecting USB hub 15 in the former in such a case, and increasing the number of the USB receptacles 12 was performed.
[0005] Although it was performed by connecting the USB plug 14 of USB hub 15 of another side to the USB receptacle 12 of one USB hub 15, when USB hub 15 was extended by such connection, the number of connection of USB hub 15 of cables 13 increased, the perimeter of the part USB hub 15 was occupied by the cable 13, and it became complicated and obstructive. It is in the purpose of this invention offering the extension structure of a USB hub where the number of cables does not increase, that is, a cable does not become obstructive, in view of the problem mentioned above, and is in offering the USB hub further used for it.
[0006]
[Means for Solving the Problem] The basic hub which has two or more USB receptacles in the field which according to invention of claim 1 possesses the cable with which the USB plug was attached at the tip, and meets in the vertical direction, The hub for extension which has two or more USB receptacles shall be used for the field which meets in the vertical direction. A guide hole and a USB receptacle are prepared in the top face of a basic hub, and the USB plug combined with the guide pin which engages with the above-mentioned guide hole, and the USB receptacle prepared in the above-mentioned top face is prepared in the inferior surface of tongue of the hub for extension. By loading the hub for extension on a basic hub, it considers as the structure where these basic hub and the hub for extension are positioned mutually, and are connected electrically.
[0007] In invention of claim 2, it considers as the structure which a guide hole and a USB receptacle are prepared in the top face of the hub for extension, and two or more hubs for extension are mutually loaded into it, and is electrically connected to it like the top face of a basic hub in invention of claim 1. According to invention of claim 3, two or more USB receptacles shall have been arranged in the field where a USB hub

meets in the vertical direction of a body case, the USB receptacle combined with the guide hole which engages with the guide pin of the hub for other party extension on the top face of a body case, and the USB plug prepared in the inferior surface of tongue of the hub for extension should be prepared, and it should be drawn from the body case in the cable with which the USB plug was attached at the tip.

[0008] According to invention of claim 4, it should be prepared in the guide pin with which two or more USB receptacles are arranged in the field which meets in the vertical direction of a body case, and a USB hub engages with the guide hole of an other party basic hub on the inferior surface of tongue of a body case, and the USB plug combined with the USB receptacle prepared in the top face of the basic hub. In invention of claim 5, in invention of claim 4, a guide hole and a USB receptacle are prepared in the top face of a body case, the above-mentioned guide hole is located in right above [of the above-mentioned guide pin], and each other is made into the configuration which can be engaged, and the USB receptacle prepared in the above-mentioned top face is located in right above [of the above-mentioned USB plug], and is mutually made into combinable structure.

[0009]

[Embodiment of the Invention] With reference to a drawing, an example explains the gestalt of implementation of this invention. In addition, the same sign is given to drawing 3 and a corresponding part. Drawing 1 shows one example of the extension structure of the USB hub by this invention, and the basic hub 21 and the hub 22 for extension are used as a USB hub in this example. The basic hub 21 has the body case 23 where the shape of a rectangular parallelepiped is made in this example, it is that by which four USB receptacles 12 have been arranged in the front face which meets in that vertical direction, and the cable 13 with which the USB plug 14 was attached is drawn from the tooth-back side of the body case 23.

[0010] The guide hole 24 of a pair is established in top-face 23a of the body case 23, and one USB receptacle 12 is formed further. As the guide hole 24 was shown in drawing in this example, it is formed in both the corners by the side of a front face, and the USB receptacle 12 is formed in the center section by the side of a tooth back. On the other hand, the hub 22 for extension possessed the body case 23 of the basic hub 21, and the body case 25 where it had the same appearance configuration, and four USB receptacles 12 were arranged in the front face which meets in the vertical direction.

[0011] By preparing the guide pin 26 and the USB plug 14 of a pair in inferior-surface-of-tongue 25b of this body case 25, these guide pins 26 and the USB plug 14 are arranged in the guide hole 24 established in top-face 23a of the body case 23 of the basic hub 21, respectively and the USB receptacle 12, and a corresponding location, and it is supposed that the guide hole 24 and engagement are possible for a guide pin 26, and the USB receptacle 12 and association of the USB plug 14 are enabled.

[0012] Let the body cases 23 and 25 be for example, the products made of resin. In this case, the guide hole 24 is formed by shaping, and can the body case 25 and really form a guide pin 26 with shaping. The connection to the basic hub 21 and the hub 22 for extension which were considered as the above configurations It is carried out by loading the hub 22 for extension on the basic hub 21, a guide pin 26 engages with the guide hole 24 of a pair, respectively, and the basic hub 21 and the hub 22 for extension are positioned mutually. Moreover, the USB receptacle 12 and the USB plug 14 which counter are combined, and the basic hub 21 and the hub 22 for extension are connected electrically.

[0013] Therefore, according to this example, there is one cable 13, without making the number of cables increase, can extend a USB hub, that is, can increase the number of the USB receptacles 12. In addition, although the basic hub 21 and the hub 22 for extension are what has four USB receptacles 12 in that front face in this example both, the number of the USB receptacles 12 is not restricted to this, and is good also for a side face respectively also as a thing of the body cases 23 and 25 which has the USB receptacle 12.

[0014] furthermore, top-face 23a countered mutually and inferior-surface-of-tongue 25b of the guide hole 24, a guide pin 26 21, for example, a basic hub, and the hub 22 for extension -- you may make it prepare in four corners, respectively Drawing 2 should show the example which enabled it to extend a USB hub further, and it should be prepared in this example in the guide hole 24 and the USB receptacle 12 at top-face 25a of that body case 25 to the hub 22 for extension which showed the hub 27 for extension to drawing 1 .

[0015] It is located in right above [of the guide pin 26 of inferior-surface-of-tongue 25b], respectively, the USB receptacle 12 is located in right above [of the USB plug 14 of inferior-surface-of-tongue 25b], namely,

the guide hole 24 of a pair is formed by these guides hole 24 and the USB receptacle 12 like the guide hole 24 established in top-face 23a of the basic hub 21, and the USB receptacle 12. If this hub 27 for extension is used, hub 27 for extension can be loaded mutually and the hub 27 for extension can be further extended on the hub 27 for extension loaded on the basic hub 21 if needed.

[0016] In addition, the connector for power sources for supplying power from an external power suitably is prepared in the basic hub 21 and the hubs 22 and 27 for extension which were mentioned above.

[0017]

[Effect of the Invention] As explained above, according to the extension structure of the USB hub by this invention Since the USB plug and receptacle which were prepared in the mutual opposed face by loading the hub for extension on a basic hub are combined and they are connected electrically, The cable for connection which existed in connection of USB hubs conventionally is unnecessary, and existence of the cable which therefore became complicated and obstructive can be canceled.

[0018] Furthermore, the hub for extension can be further extended on the hub for extension, without making the number of cables increase if needed according to invention of claim 2, since the hubs for extension can be loaded and it can connect.

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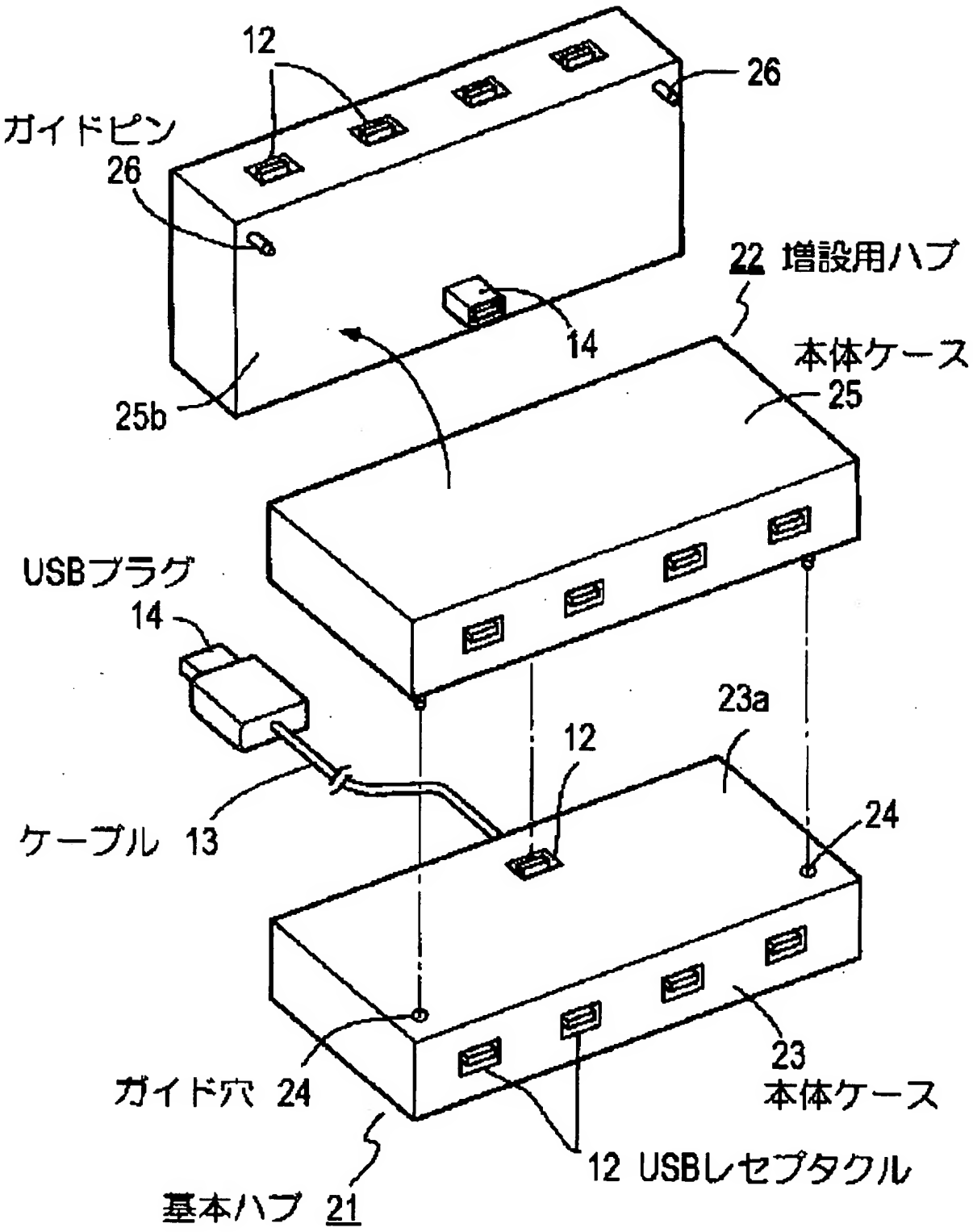
CLAIMS

[Claim(s)]
[Claim 1] The basic hub which has two or more USB receptacles in the field which possesses the cable with which the USB plug was attached at the tip, and meets in the vertical direction, It is the extension structure of a USB hub which consists of a hub for extension which has two or more USB receptacles in the field which meets in the vertical direction. A guide hole and a USB receptacle are prepared in the top face of the above-mentioned basic hub. When the USB plug combined with the guide pin which engages with the above-mentioned guide hole, and the USB receptacle prepared in the above-mentioned top face is prepared in the inferior surface of tongue of the above-mentioned hub for extension and loads the above-mentioned hub for extension on the above-mentioned basic hub Extension structure of the USB hub characterized by positioning these basic hub and the hub for extension mutually, and connecting them electrically.
[Claim 2] Extension structure of the USB hub characterized by considering as the structure which a guide hole and a USB receptacle are prepared in the top face of the above-mentioned hub for extension, and two or more hubs for extension are mutually loaded into it like the top face of the above-mentioned basic hub, and is electrically connected to it in the extension structure of a USB hub according to claim 1.
[Claim 3] The USB hub characterized by to be drawn the cable with which two or more USB receptacles have been arranged in the field which meets in the vertical direction of a body case, the USB receptacle combined with the guide hole which engages with the guide pin of the hub for other party extension, and the USB plug prepared in the inferior surface of tongue of the hub for extension was prepared in the top face of the above-mentioned body case, and the USB plug was attached at the tip from the above-mentioned body case.
[Claim 4] The USB hub characterized by arranging two or more USB receptacles in the field which meets in the vertical direction of a body case, and preparing the guide pin which engages with the guide hole of an other party basic hub, and the USB plug combined with the USB receptacle prepared in the top face of the basic hub in the inferior surface of tongue of the above-mentioned body case.
[Claim 5] It is the USB hub characterized by to prepare a guide hole and a USB receptacle in the top face of the above-mentioned body case , to locate the above-mentioned guide hole in right above [of the above-mentioned guide pin] , to make each other into the configuration which can be engaged in a USB hub according to claim 4 , to locate in right above [of the above-mentioned USB plug] the USB receptacle prepared in the above-mentioned top face , and to consider as combinable structure mutually .

[Translation done.]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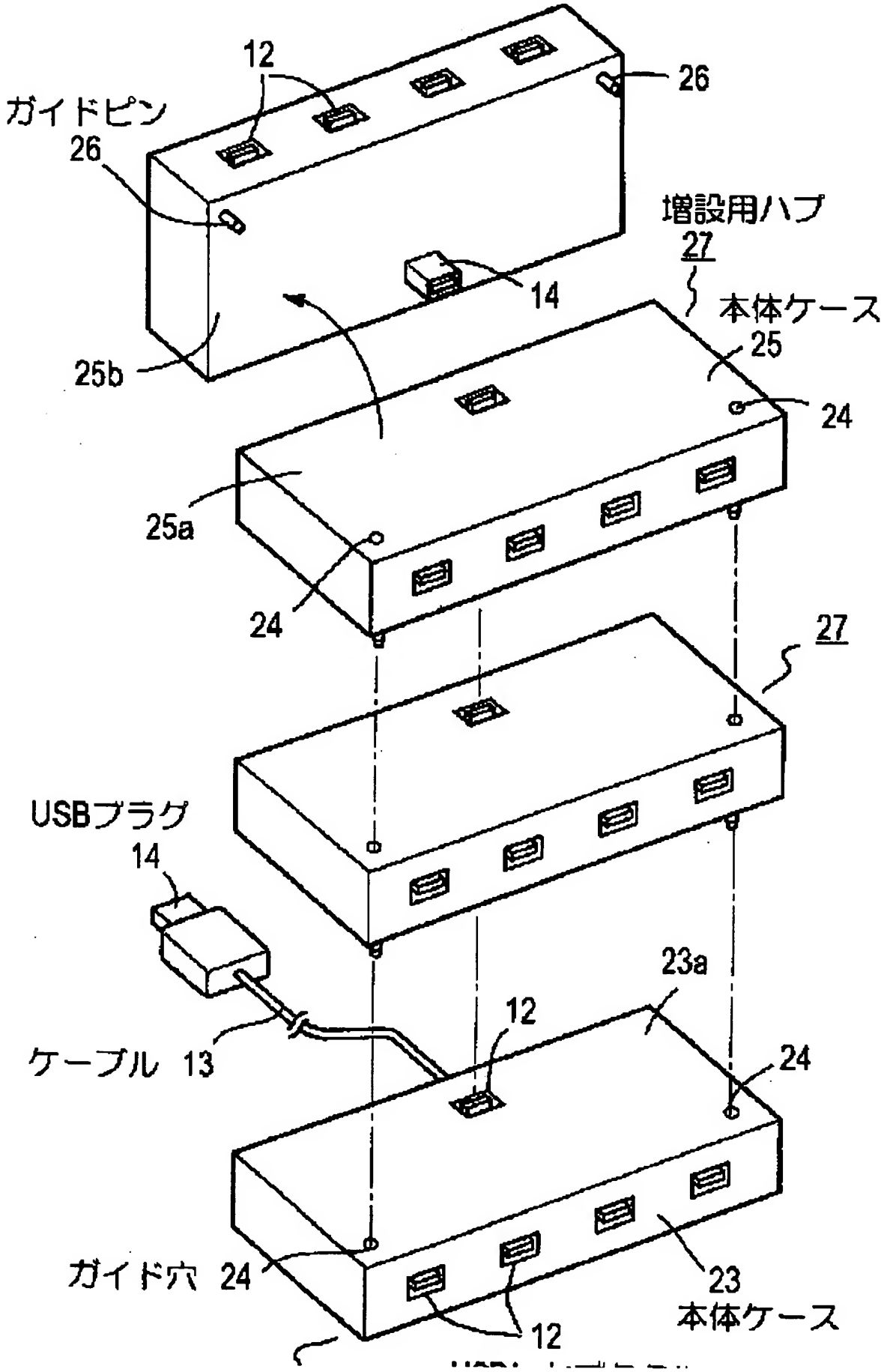
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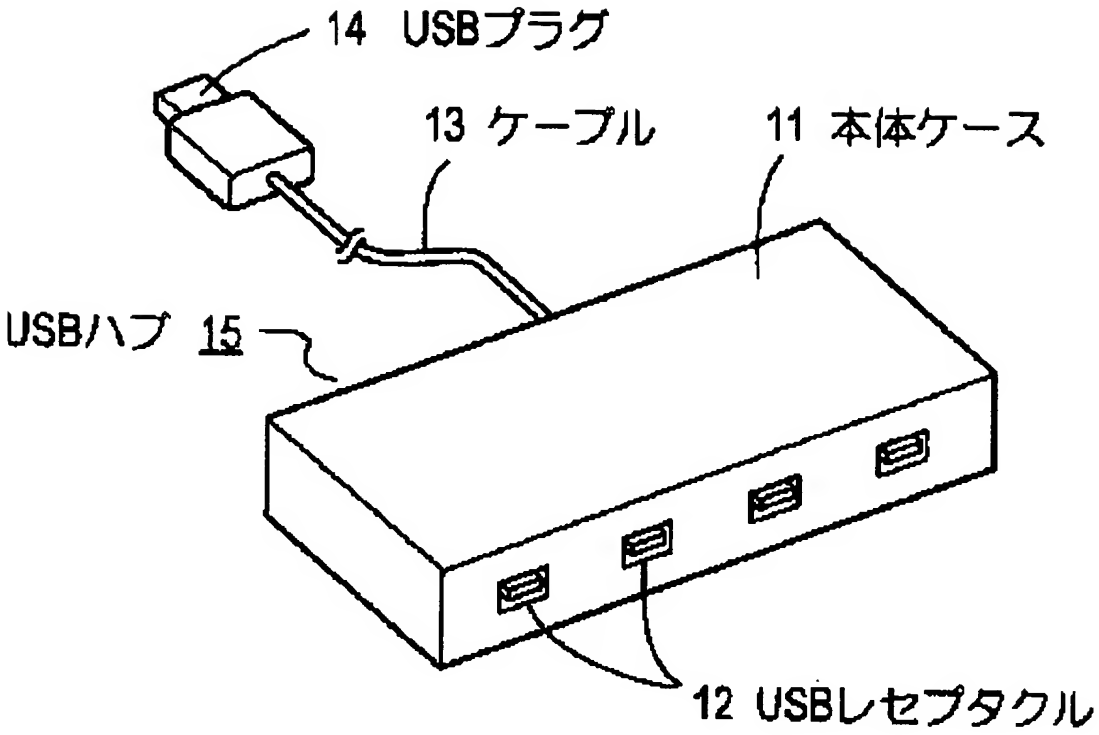

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